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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/783,542	PFISTER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Chikaodili E. Anyikire	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 20 February 2004.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-31 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-31 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 20 February 2004 is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 20040319.  
4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.  
5)  Notice of Informal Patent Application  
6)  Other: \_\_\_\_.

## DETAILED ACTION

1. This application is responsive to application number (10783542) filed on February 20, 2004. Claims 1-31 are pending and have been examined.

### ***Information Disclosure Statement***

2. Acknowledgement is made of applicant's information disclosure statement.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The parameter "U" is not defined.

5. Claim 23 recites the limitation "viewing parameters" in claim 23. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-4, 14, 16, 20-24, and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 5, 714, 997) in view of Wenger et al (US 2004/0179591).

As per claim 1, Anderson discloses a three-dimensional television system, comprising:

an acquisition stage, comprising:

a plurality of video cameras, each video camera configured to acquire a video of a dynamically changing scene in real-time (Fig 3, 10-1 – 10-m, Fig 4, 112; Col 8 Ln 63 – Col 9 Ln 4); and

a plurality of producer modules connected to the plurality of video cameras, the producer modules configured to compress the videos to compressed videos and to determine viewing parameters of the plurality of video cameras (Fig 3, 10-1 – 10-m, Fig 4, 112; Col 8 Ln 63 – Col 9 Ln 4 and Col 10 Ln 9-17);

a display stage, comprising:

a plurality of decoder modules configured to decompress the compressed videos to uncompressed videos (Fig 3, 30-1 – 30-p (Decoding and Display); Col 8 Ln Fig 31, 2301; Col 9 Ln 39-47);

a plurality of consumer modules configured to generate a plurality of output videos from the decompressed videos (Fig 3, 30-1 – 30-p (Decoding and Display); Col 8 Ln Fig 31, 2301; Col 9 Ln 39-47);

a controller configured to broadcast the viewing parameters to the plurality of decoder modules and the plurality of consumer modules (Fig 3, 20 and Fig 5, 304; Col 9 Ln 5-22 and Col 10 Ln 60-67);

a three-dimensional display unit configured to concurrently display the output videos according to the viewing parameters (Fig 5, 30; Col 10 Ln 60-Col 11 Ln 34); and

means of connecting the plurality of decoder modules, the plurality of consumer modules, and the plurality of display units (Fig 5, 30; Col 10 Ln 60-Col 11 Ln 34); and

a transmission stage,

connecting the acquisition stage to the display stage, configured to transport the plurality of compressed videos and the viewing parameters (Fig 3, 20; Col 9 Ln 5-30).

However, Anderson does not explicitly teach means for synchronizing the plurality of video cameras.

In the same field of endeavor, Wenger et al disclose means for synchronizing the plurality of video cameras ([0043] Ln 1-8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with

the cameras of Wenger. The advantage is that it simplifies the synchronization signal of the rate control algorithm used by the DSPs.

As per claim 2, Anderson et al disclose the system of claim 1, further comprising a plurality of cameras to acquire calibration images displayed on the three-dimensional display unit to determine the viewing parameters (Col 12 Ln 39-49).

As per claim 3, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the display units are projectors.

In the same field of endeavor, Wenger et al teach in which the display units are projectors (Fig 11, P1-P4; [0013] Ln 6-13).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the display projectors of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the transmission of the plurality of images in order to optimize the overall picture quality in a video transmission.

As per claim 4, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the display units are organic light emitting diodes.

However, it is well known in the art to implement this configuration of display units by using organic light emitting diodes as stated by the applicant in background of the instant application.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger to provide multi-projector displays with organic light emitting diodes because it is a well-known configuration conventionally used in the art.

As per claim 14, Anderson discloses the system of claim 1, in which each producer module is connected to a subset of the plurality of video cameras (Fig 3, 10-1 – 10-m, Fig 4, 112; Col 8 Ln 63 – Col 9 Ln 4 and Col 10 Ln 9-17).

As per claim 16, Anderson discloses the system of claim 1, in which the plurality of video cameras are arranged arbitrarily (Fig 3, 10-1 – 10-m, Fig 4, 112; it can be seen by the prior art that the cameras are arranged in an arbitrary manner).

As per claim 20, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which each video is compressed individually and temporally.

In the same field of endeavor, Wenger et al teach in which each video is compressed individually and temporally ([0039] and [0040]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the transmission of the plurality of images in order to optimize the overall picture quality in a video transmission.

As per claim 21, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the viewing parameters include a position, orientation, field-of-view, and focal plane, of each video camera.

However, it is well known in the art to use viewing parameters that include a position, orientation, field-of-view, and focal plane for a video camera (Official Notice).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger to apply viewing parameters such as position, orientation, field of view and focal plain of video cameras.

As per claim 22, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the controller determines, for each output pixel  $o(x, y)$  in the output video, a view number  $v$  and a position of each source pixel  $s(v, x, y)$  in the decompressed videos that contributes to the output pixel in the output video.

In the same field of endeavor, Wenger et al teach in which the controller determines, for each output pixel  $o(x, y)$  in the output video, a view number  $v$  and a position of each source pixel  $s(v, x, y)$  in the decompressed videos that contributes to the output pixel in the output video ([0040], [0041], and [0043]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the

transmission of the plurality of images in order to optimize the overall picture quality in a video transmission as an standard part of MPEG video compression.

As per claim 23 refer to rejection of claim 22 and also the output pixel values are fundamentally a linear combination of source (input) pixels value.

As per claim 24, Anderson discloses a system.

However, Anderson does not explicitly teaches in which a block of the source pixels contribute to each output pixel.

In the same field of endeavor, Wenger et al teaches in which a block of the source pixels contribute to each output pixel ([0038] Ln 25 – 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the transmission of the plurality of images in order to optimize the overall picture quality in a video transmission as an standard part of MPEG video compression (output pixel values are always a function of input pixel values).

As per claim 27, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which an arrangement of the cameras and an arrangement of the display units, with respect to the display unit, are substantially identical.

In the same field of endeavor, Wenger et al teach in which an arrangement of the cameras and an arrangement of the display units, with respect to the display unit, are substantially identical (Fig 1 C1-C4 and P1-P4).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the display units of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the transmission of the plurality of images in order to optimize the overall picture quality in a video transmission.

As per claim 28, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the plurality of cameras acquire high-dynamic range videos.

In the same field of endeavor, Wenger et al teach in which the plurality of cameras acquire high-dynamic range videos ([0010] and [0011]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the transmission of the plurality of images in order to optimize the overall picture quality in a video transmission.

As per claim 29, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the display units display high-dynamic range images of the output videos.

In the same field of endeavor, Wenger et al teach in which the display units display high-dynamic range images of the output videos ([0013] Ln 6-13).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Wenger. The advantage is that it adjusts the picture quality for each of a plurality of images that comprise a picture and that distributes or balances the transmission of the plurality of images in order to optimize the overall picture quality in a video transmission.

As per claim 30, arguments analogous to those presented for claim 1 are applicable to claim 30.

As per claim 31, arguments analogous to those presented for claim 1 are applicable to claim 31.

9. Claims 5-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 5, 714, 997) in view of Wenger et al (US 2004/0179591), and in further view of Tung (US 2002/0122145).

As per claim 5, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the three-dimensional display unit uses front-projection.

In the same field of endeavor, Tung discloses the system of claim 1, in which the three-dimensional display unit uses front-projection ([0037]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson by incorporating the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 6, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the three-dimensional display unit uses rear-projection.

In the same field of endeavor, Tung discloses in which the three-dimensional display unit uses rear-projection ([0037]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 7, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the display unit uses two-dimensional display element.

In the same field of endeavor, Tung discloses in which the display unit uses two-dimensional display element ([0036] Ln 4-6).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with

the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 8, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the display unit is flexible, and further comprising passive display elements.

In the same field of endeavor, Tung discloses in which the display unit is flexible, and further comprising passive display elements [0039]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 9, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the display unit is flexible, and further comprising active display elements.

In the same field of endeavor, Tung discloses in which the display unit is flexible, and further comprising active display elements ([0039]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 10, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which different output images are displayed depending on a viewing direction of a viewer.

In the same field of endeavor, Tung discloses in which different output images are displayed depending on a viewing direction of a viewer ([0036]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 11, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which static view-dependent images of an environment are displayed such that a display surface disappears.

In the same field of endeavor, Tung discloses in which static view-dependent images of an environment are displayed such that a display surface disappears ([0036]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 12, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which dynamic view-dependent images of an environment are displayed such that a display surface disappears.

In the same field of endeavor, Tung discloses in which dynamic view-dependent images of an environment are displayed such that a display surface disappears ([0036]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

As per claim 13, Anderson discloses the system of claim 1.

However, Anderson does not explicitly teach in which the view-dependent images of the environment are acquired by a plurality of cameras.

In the same field of endeavor, Tung discloses in which the view-dependent images of the environment ([0036]) are acquired by a plurality of cameras (Fig 2, C1-C4; [0040] Ln 1-4).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the virtual reality television of Anderson with the method of Tung. The advantage is that it reduces the flickering in a stereoscopic display system.

10. Claims 15 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 5, 714, 997) in view of Wenger et al (US 2004/0179591), and in further view of Haskell et al (US 6,055,012).

As per claim 15, modified device of Anderson discloses the system of claim 1.

However, modified device Anderson does not explicitly teach in which the plurality of video cameras are in a regularly spaced linear and horizontal array.

In the same field of endeavor, Haskell et al et al teach in which the plurality of video cameras are in a regularly spaced linear and horizontal array (Fig 1, 101-104 and Fig 2, Ln C1-C4; Col 6 Ln 11-27 and Col 7 Ln 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modified virtual reality television of Anderson with the cameras of Haskell et al because it performs efficient compression of multi-view video images.

As per claim 17, the modified device of Anderson discloses the system of claim 1.

However, the modified device of Anderson does not explicitly teach in which an optical axis of each video camera is perpendicular to a common plane, and the up vectors of the plurality of video cameras are vertically aligned.

In the same field of endeavor, Haskell et al teach in which an optical axis of each video camera is perpendicular to a common plane, and the up vectors of the plurality of video cameras are vertically aligned (Fig 2, C1-C4; Col 7 Ln 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the modified version of the virtual reality television of Anderson with the cameras of Haskell et al because it results in a very flexible system.

As per claim 18, the modified device of Anderson discloses the system of claim 1 in which the viewing parameters include intrinsic parameters of the video cameras (Col 12 Ln 39-49).

However, the modified device of Anderson does not disclose viewing parameters include extrinsic parameters of the video cameras.

In the same field of endeavor, Haskell et al disclose viewing parameters include extrinsic parameters (Fig 1, 101-104 and Fig 2, Ln C1-C4; Col 6 Ln 11-27 and Col 7 Ln 24-39).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modified virtual reality television of Anderson with the cameras of Haskell et al because it performs efficient compression of multi-view video images.

As per claim 19, the modified device of Anderson discloses the system of claim 1.

However, the modified device of Anderson does not explicitly teach further comprising: means for selecting a subset of the plurality of cameras for acquiring a subset of videos.

In the same field of endeavor, Wenger et al teach further comprising: means for selecting a subset of the plurality of cameras for acquiring a subset of videos (Col 7 Ln 40-Col 8 Ln 5).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the modified device of virtual reality television

of Anderson with the view selection of Haskell because it provide the user flexibility of selecting cameras compatible to scene configuration.

11. Claims 25 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson (US 5, 714, 997) in view of Wenger et al (US 2004/0179591), and in further view of Morishita (US 4, 737, 840).

As per claim 25, Anderson discloses the system of claim 1.

However, the modified system of Anderson does not explicitly teach in which the three-dimensional display unit includes a display-side lenticular sheet, a viewer-side lenticular sheet, a diffuser, and substrate between each lenticular sheets and the diffuser.

In the same field of endeavor, Morishita discloses in which the three-dimensional display unit includes a display-side lenticular sheet, a viewer-side lenticular sheet, a diffuser, and substrate between each lenticular sheets and the diffuser (Col 7 Ln 61 – Col 8 Ln 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the modified virtual reality television of Anderson according to Morishita's invention to incorporate features recited in claim 25 because it provides brighter pictures and widens the range of viewing angles.

As per claim 26, Anderson discloses the system of claim 1.

However, the modified system of Anderson does not explicitly teach in which the three-dimensional display unit includes a display-side lenticular sheet, a reflector, and a substrate between the lenticular sheets and the reflector.

In the same field of endeavor, Morishita discloses in which the three-dimensional display unit includes a display-side lenticular sheet, a reflector, and a substrate between the lenticular sheets and the reflector (Col 8 Ln 4-17).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to modify modified the virtual reality television of Anderson according to Morishita's invention to incorporate features recited in claim 26 because it provides brighter pictures and widens the range of viewing angles.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chikaodili E. Anyikire whose telephone number is (571) 270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272 - 7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CEA

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TC 2600